IN THE CLAIMS:

1. (Currently Amended) A method comprising a process for processing a microstructure, said process comprising:

loading the microstructure into an etch chamber of an etch system, wherein the microstructure comprises a sacrificial material and one or more structural materials; and

etching the sacrificial material, further comprising:

providing an amount of spontaneous vapor phase etchant recipe to the etch system;

detecting an amount of a chemical species flowing out of the etch chamber resulting from etching of the sacrificial material from the present spontaneous vapor phase etchant recipe;

measuring the ~~an~~ amount of the ~~a~~ chemical species in the process;

determining a feeding time based on the measurement; and

further etching the sacrificial material by providing an additional amount of the spontaneous vapor phase etchant recipe to the etch system based on the determined feeding time to continue the process.

2. (Original) The method of claim 1, wherein the chemical species is an etchant of the etchant recipe.

3. (Original) The method of claim 1, wherein the chemical species is an etch product.

4. (Canceled)

5. (Original) The method of claim 1, wherein the spontaneous vapor phase etchant recipe comprises a noble gas halide.

6. (Original) The method of claim 5, wherein the noble gas halide is xenon difluoride.

7. (Original) The method of claim 1, wherein the etchant recipe comprises a spontaneous interhalogen.

8. (Original) The method of claim 7, wherein the interhalogen comprises bromine trichloride or bromine fluoride.

9. (Original) The method of claim 1, wherein the etchant recipe comprises vapor phase HF.

10. (Original) The method of claim 1, wherein the etchant recipe comprises a diluent gas.

11. (Original) The method of claim 10, wherein the diluent gas is an inert gas that is selected from N_2, He, Ar, Kr and Xe.

12. (Original) The method of claim 1, wherein the step of providing the additional amount of the etchant is performed when a change of the measured amount of the chemical species over time is beyond a predetermined value.

13. (Original) The method of claim 1, wherein the step of providing the spontaneous vapor phase etchant further comprises:

preparing the etchant in an exchange chamber; and

feeding the prepared etchant via an outer circulation loop that passes through the exchange chamber and an etch chamber in which the microstructure is held.

14. (Original) The method of claim 13, further comprising: opening the outer circulation loop for feeding another additional amount of the etchant into the etch system.

15. (Previously Presented) The method of claim 1, further comprising: repeating the steps of claim 1 until the measurement of the amount of the chemical species is equal to or below another predefined value.

16. (Original) The method of claim 1, further comprising: coating the microstructure with a SAM material.

17. (Original) The method of claim 1, wherein the etchant has a pressure from 0 to 15 torr.

18. (Original) The method of claim 10, wherein the diluent gas has a partial pressure from 20 to 700 torr.

19. (Original) The method of claim 18, wherein the diluent gas has a partial pressure from 50 to 100 torr.

20. (Original) The method of claim 10, wherein the diluent gas has a partial pressure from 500 to 700 torr.

21. (Original) The method of claim 10, wherein the diluent gas has a partial pressure around 100 torr.

22. (Canceled)

23. (Canceled)

24. (Previously Presented) The method of claim 15, wherein the predefined value is 1% of an initial etch rate or an initial surface area.

25. (Previously Presented) The method of claim 12, wherein the predefined value is 20% of an initial etch rate or an initial surface area.

26. (Previously Presented) The method of claim 1, wherein the structural materials remain in

the microstructure after the sacrificial materials are removed, wherein the structural material is selected from an elemental metal, a metalloid, an intermetallic compound and a ceramic material.

27. (Original) The method of claim 26, wherein the elemental metal is selected from Al, Cu and Pt.

28. (Original) The method of claim 26, wherein the intermetallic compound is selected from Ti_xAl_x and TiNi.

29. (Original) The method of claim 26, wherein the ceramic material comprises a transition metal nitride, transition metal oxide, transition metal carbide, transition metal oxynitride, transition metal silicon nitride, transition metal silicon oxynitride, metalloid nitride, metalloid oxide, metalloid carbide, metalloid oxynitride.

30-62. (Canceled)

63. (Previously Presented) A method of etching a plurality of microstructures in an etch chamber, the method comprising:

collecting data of a parameter during a first etching process for a first microstructure using an etchant recipe that comprises a spontaneous vapor phase etchant;

determining a variation profile of the parameter in the first etch process; and

etching a second microstructure in a second etching process using the etchant recipe based on the collected data of the parameter in the first etching process and wherein the parameter is a detected chemical species during the etch.

64. (Original) The method of claim 63, wherein the measure parameter is selected from a concentration of an etch product, the concentration of the etchant, an etch rate and a surface area

of a sacrificial material.

65. (Canceled)

66. (Previously Presented) The method of claim 63, wherein the etchant recipe comprises an interhalogen.

67. (Original) The method of claim 66, wherein the interhalogen comprises bromine trifluoride.

68. (Original) The method of claim 65, wherein the etchant recipe comprises a noble gas halide.

69. (Original) The method of claim 68, wherein the noble gas halide comprises xenon difluoride.

70. (Original) The method of claim 65, wherein the etchant recipe comprises a non-etchant diluent gas.

71. (Original) The method of claim 70, wherein the non-etchant diluent gas comprises an inert gas that is selected from N_2, He, Ar, Kr Ne and Xe.

72-80. (Canceled)